THE BERNARD M. BARUCH COLLEGE
OF
THE CITY UNIVERSITY OF NEW YORK
17 LEXINGTON AVENUE • NEW YORK, N. Y. 10010
533-7480

HERBERT ARKIN
Professor Emeritus

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Mr. H. Thomas Austern
Covington & Burling
1201 Pennsylvania Avenue N.W.
P.O. Box 7566
Washington, D.C. 20044

Dear Mr. Austern:

As requested, I have examined the data records consisting of laboratory determination calculation sheets and statistical summary sheets which you represented to me to be copies of the original laboratory data sheets compiled by the Federal Trade Commission and used as the basis for figures on "tar" TPM (Dry) and nicotine yields of various brands of cigarettes as well as the final reports on these data released by the Federal Trade Commission.

It was the laboratory data sheets for the "tar" and nicotine figures released by the Federal Trade Commission under the date March 1983 which I examined and upon which I report in this letter.

PM3001060580

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

The number of brands tested in the current report rose to 208 as compared with 200 in the prior report.[1]

The number of calculational errors dropped to 16. There was a tremendous increase in impossible figures to a total of 305. Further, there were 7 instances of incorrect posting to the summary sheets. In addition there were 7 errors in posting CO figures from the computer sheets to the lab sheets.

The number of deletions of determinations increased and remained high with 16.5% of the determinations deleted. The number of deletions excluding "deleted days" rose from 235 for Test No. 24 to 269 for the current test (No. 25).

There continues to be evidence of variations resulting in wide swings in the daily levels of the reported data in spite of large scale deletions of all determinations for entire days. The phenomena are similar to those reported in my prior letters.

A new monitor cigarette blend greatly reduced the level of TPM (Dry), Nicotine and CO determinations as compared with prior tests. It is my understanding that this was done to bring into line with current brands the average levels.

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1. The prior tests performed by the FTC laboratory were dated November 20, 1967-No. 1; June 11, 1968-No. 2; October 10, 1968-No. 3; February 27, 1969-No. 4; July 9, 1969-No. 5; November 19, 1969-No. 6; May 18, 1970-No. 7; October 21, 1970-No. 8; August 1971-No. 9; March 1972-No. 10; August 1972-No. 11; February 22, 1973-No. 12; September 18, 1973-No. 13; March 1974-No. 14; September 1974-No. 15; March 1975-No. 16; September 1975-No. 17; April 1976-No. 18; November 1976-No. 19; August 1977-No. 20; May 1978-No. 21; December 1979-No. 22; March 1981-No. 23; December 1981-No. 24.

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However, the function of the monitor cigarettes is to detect when brand test runs smoked at the same time are out of line.

The use of a monitor blend with lower levels of TPM (Dry), nicotine and CO will greatly reduce the ability to detect such shifts since the variation in low determination tests are less and therefore the test is less sensitive.

The lower the average, the less the variability. This is already compounded by the many very low level cigarettes for which virtually no variability can be detected.

The radical nature of the drop in levels may be seen below:

TPM (Dry) and Nicotine
Measurements
Federal Trade Commission
Monitor Cigarettes

Test No.	Average TPM (Dry)	Average Nicotine
#15	18.0	1.30
#16	18.1	1.28
#17	18.1	1.29
#18	18.1	1.29
#19	18.0	1.26
#20	18.9	1.36
#21	18.7	1.36
#22	18.4	1.34
#23	16.6	1.22
#24	16.4	1.22
#25	13.5	.80

A. CARBON MONOXIDE MEASUREMENTS

The average carbon monoxide measurement for monitor cigarettes for the FTC and TITL laboratories were in close agreement. The average monitor CO measurement for the FTC laboratory was 13.55 as compared with 13.52 for the TITL laboratory.

There was good agreement for TPM (Dry) between the two laboratories with an average of 13.47 for FTC and 13.26 for TITL. However, the average monitor nicotine was 4.2% higher at the TITL laboratory with .833 for

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TITL and .80 for FTC.

I have previously reported on the correlation between the TPM measurements and the CO values. Evidence of this relationship continues, as well as the peculiarity that unlike brands with low TPM (Dry), the high TPM brands (over 20 mgms) showed CO averages less than the TPM averages.

TPM (Dry) and Carbon Monoxide Values
for 202 Brands of Cigarettes
as Reported in the FTC Report
Dated March 1983

TPM (Dry) Level (mgms)	Average TPM (Dry) mgms	Average Carbon Monoxide mgms	Number of Brands
0 - 19	10.4	10.8	185
20 and over	23.6	16.0	17
Overall	11.5	11.3	202

B. CALCULATIONAL AND POSTING ERRORS

The level of calculational errors has declined over that of the previous test to a total of 16. (See Appendix I for details)

Number of Calculational Errors*
"Tar", Nicotine and Carbon Monoxide Determinations
Federal Trade Commission
Laboratory Sheets

Date of Report	Brand Cigarettes	Monitor Cigarettes	Total
October 10, 1968	65	**	
February 27, 1969	73	**	
July 9, 1969	42	**	
November 19, 1969	43	20	63
May 18, 1970	60	15	75
October 21, 1970	5	0	5
August 1971	4	18	22
March 1972	2	1	3

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Date of Report	Brand Cigarettes	Monitor Cigarettes	Total
August 1972	4	4	8
February 22, 1973	12	3	15
September 1973	23	1	24
March 1974	2	1	3
September 1974	4	2	6
March 1975	6	4	10
September 1975	1	1	2
April 1976	0	0	0
November 1976	8	1	9
August 1977	6	5	11
May 1978	6	1	7
December 1979	7	1	8
March 1981	12	4	16
December 1981	22	3	25
March 1983	16	0	16***

*Calculational differences were counted only if the error was at least 0.2 mgms for TPM (Dry) and 0.02 for nicotine. The individual errors are listed in Appendix I.

**Not counted for these reports.

***The calculational errors resulted in an increase in TPM (Dry) for True f sp m 85mm of .2 mgm and nicotine for Kent III f sp 85mm of .02 mgm.

There were a total of 7 errors in posting from the laboratory sheets to the summary sheets, 4 for the monitor cigarettes and 3 for brands, one resulting in a change in the CO value for Lark F. SP, 85mm from 14.3 to 14.1 mgms. The figure included in the FTC report for March is incorrect. In addition, there were 7 errors in posting from the computer sheets to the laboratory sheets. These posting errors are detailed in Appendix II .

A more serious problem has become evident for low tar cigarettes with the use of the new smoking machine. There were 71 cases in which the TPM (Wet) and/or TPM (Dry) were calculated to be negative figures. In addition, there were negative figures for water in 274 determinations for brand tests. (See appendix III) This of course is impossible, but nevertheless these values were posted to the summary sheets as negative values. Thus, in computing the averages for a brand the values were totalled considering the negative figures incorrectly as values to be subtracted. The result

Low tar cigts

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

is that these impossible values serve to reduce the brand average improperly.

This practice results in figures of dubious meaning and value. In my opinion, whenever an impossible figure arises, such as negative TPM or water values, they should simply be discarded and not used in any computation.

With the increasing number of low TPM cigarettes, the measurement of TPM and CO in the very low range has been and will be an increasing problem. It is suggested that it might be wise to consider methods of dealing with this problem. The low value figures produced for some cigarettes by FTC are of very questionable meaning.

C. DISCARDS

In my prior analysis it was noted that a considerable amount of data on the laboratory sheets were discarded by merely stamping the column for the determination "deleted". It was observed that the result of such a practice is to falsely give an impression of greater uniformity of test results than actually exists in practice.

In the last test (#24), a decline in the number of discards was observed. The records for this report (#25, March 1983) indicate a considerable increase in this practice. There were 1029 discarded determinations, 199 for monitor cigarettes and 830 for brand cigarette determinations.

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Nicotine and TPM Determinations
Discarded in Tests 5 Through 25

Test Number	Monitor Cigarettes	Brand Cigarettes	Total
5	77	62	139
6	19	72	91
7	94	272	366
8	17	76	93
9	158	232	390
10	436	235	671
11	333	193	526
12	263	231	494
13	165	216	381(a)
14	283	163	446
15	202	533	735
16	106	294	400(b)
17	296	815	1111(c)
18	117	359	476(d)
19	156	581	737(e)
20	221	746	967(f)
21	163	587	750(g)
22	212	982	1194(h)
23	650	1934	2584(i)
24	201	668	869(j)
25	199	830	1029(k)

(a) Includes 14 deletions on summary sheets not on lab sheets.

(b) Includes 186 deletions where it was indicated that all data for that day was deleted (stamped deleted day) and 2 instances where deletions were made on the summary sheets but not the lab sheets.

(c) Includes 896 deletions where it was indicated that all data for that day was deleted and 2 instances where deletions were made on summary sheets but not lab sheets.

(d) Includes 297 deletions where it was indicated that all data for that day was deleted and 2 instances where deletions were made on summary sheets but not on lab sheets.

(e) Includes 439 deletions where it was indicated that all data for that day were deleted.

(f) Includes 787 deletions where it was indicated that all data for that day were deleted.

(g) Includes 292 deletions where it was indicated that all data for that day were deleted and 7 instances where deletions were made on the summary sheets but not on lab sheets.

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

(h) Includes 700 deletions where it was indicated that all data for that day were deleted and 5 deletions were made on the summary sheets but not indicated on the lab sheets.

(i) Includes 2114 deletions where it was indicated that all data for that day were deleted and 20 deletions were made on the summary sheets but not indicated on the lab sheets.

(j) Includes 634 deletions where it was indicated that all data for that day were deleted and 24 deletions were made on the summary sheets but not indicated on the lab sheets.

(k) Includes 760 deletions where it was indicated that all data for that day were deleted and 15 deletions were made on the summary sheets but not indicated on the lab sheets.

The 1029 deletions constituted 16.5% of all determinations. Thus 1 in every 6 determinations noted on the laboratory sheets were ultimately discarded.

D. VARIATIONS IN TEST LEVELS

As in the past, the FTC laboratory has included control (monitor) cigarettes in each smoking runs for brand tests. These cigarettes are samples of a larger homogeneous group of cigarettes manufactured for this purpose.

Previous tests have shown wide variability in the TPM and nicotine determinations for both day to day variation and period to period variation.

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Monitor and Brand Cigarettes
Carbon Monoxide Measurements
March 1983

Day	Monitor Average Carbon Monoxide	Number of Brands Below Average	Above Average
July 2, 1983	14.4	16	62
Overall Average	13.5		

Monitor and Brand Cigarettes
Nicotine Determinations
March 1983

Day	Monitor Average Nicotine	Number of Brands Below Average	Above Average
July 14, 1982	.85	18	60
Overall Average	.80		

The highest daily average were found to be July 2 for carbon monoxide and July 14 for nicotine. The CO average for July 2 was 14.4 with the overall average of 13.5 and for nicotine the July 14 value was .85 compared with the overall average for monitor cigarettes of .80.

These fluctuations are confirmed by similar variations in the brand tests for carbon monoxide.

E. ROUNDING ERRORS

The rounding error problem has increased with a total of 22 errors in this FTC report as compared with 20 in the December 1981 report. These errors are listed in Appendix IV.

It will be recalled that the apparent rounding method was to round up the TPM average if it was 5 or more in the tenths of a mgm position and down

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if less. In similar fashion the nicotine average would be rounded up if there was a 5 or more in the hundreths position. Carbon monoxide averages would be handled in the same manner as that for TPM.

F. SHIFTS BETWEEN TESTS

For 6 brands there were significant changes in TPM (Dry) levels as compared with the prior test (#24). Similarly, there were 7 shifts in the nicotine levels and 4 for CO. Some of these changes were very large. (See Appendix v) Yet, the usual notes about reformulations were not included in the FTC report.

Sincerely,

Herbert Arkin

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Appendix I

Federal Trade Commission

TPM (Dry), Nicotine and Carbon Monoxide Measurements

Data Dated March 1983

Calculational Errors on Laboratory Sheets

Date	Cigarette No.	Run	Port	TPM (Dry) Original	TPM (Dry) Corrected	Nicotine Original	Nicotine Corrected	See Notes*
				BRAND CIGARETTES				
4/07/82	185	1	20	1.6	4.8			1
4/14/82	62	2	10	13.3	12.5			2
4/15/82	71	6	13	11.0	10.3			3
4/28/82	108	5	8	3.7	3.5	.03	.29	4
4/29/82	165	3	20	15.6	15.9			5
5/04/82	63	3	16	2.8	2.6	.03	.29	6
5/05/82	53	3	17			1.01	.95	7
5/06/82	196	2	3			.81	.69	8
5/06/82	55	2	12			.77	.73	9
6/04/82	51	6	20			1.05	1.13	10
6/16/82	179	6	15			.69	.72	11
6/24/82	36	2	6	6.9	6.7			12
7/12/82	193	6	10			.92	.94	13
7/13/82	70	1	14			.72	.74	14
7/13/82	106	2	5			.61	.63	15
7/19/82	119	4	6	16.3	16.5			16

*NOTES:

1. TPM (Dry) Calculation: 5.3 - .10 - .42 = 4.8 not 1.6

2. TPM (Dry) Calculation: 14.8 - 1.31 - .96 = 12.5 not 13.3

3. TPM (Dry) Calculation: 12.0 - .99 - .71 = 10.3 not 11.0

4. Nicotine Calculation: $\frac{10((.9048 \div 3.7843) + .0015)}{1.6413\ (5)}$ = .29 not .03

   Therefore, TPM (Dry) = 3.8 - .03 - .29 = 3.5 not 3.7

5. TPM (Wet) Calculation: $\frac{1000(32.6431 - 32.5514)}{5}$ = 18.3 not 18.0

   Therefore, TPM (Dry) = 18.3 - 1.26 - 1.11 = 15.9 not 15.6

6. Nicotine Calculation: $\frac{10((.8526 \div 3.6280) + .0036)}{1.6315\ (5)}$ = .29 not .03

   Therefore, TPM (Dry) = 2.8 - (-.05) - .29 = 2.6 not 2.8

7. Nicotine Calculation: $\frac{10((3.2540 \div 4.1222) + .0061)}{1.6826\ (5)}$ = .95 not 1.01

8. Nicotine Calculation: $\frac{10((2.4325 \div 3.9369) + (-.0055))}{1.7653\ (5)}$ = .69 not .81

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

*NOTES:

9. Nicotine Calculation: $\frac{10((2.2626 \div 3.7387) + .0057)}{1.6814\ (5)} = .73$ not .77

10. Nicotine Calculation: $\frac{10((3.2436 \div 3.6392) + .0126)}{1.5985\ (5)} = 1.13$ not 1.05

11. Nicotine Calculation: $\frac{10((2.2113 \div 3.8756) + .0083)}{1.6124\ (5)} = .72$ not .69

12. TPM (Dry) Calculation: 7.7 - .46 - .59 = 6.7 not 6.9

13. Nicotine Calculation: $\frac{10((2.5037 \div 3.3497) + .0226)}{1.6385\ (5)} = .94$ not .92

14. Nicotine Calculation: $\frac{10((1.9923 \div 3.3987) + .0226)}{1.6385\ (5)} = .74$ not .72

15. Nicotine Calculation: $\frac{10((1.6644 \div 3.3585) + .0226)}{1.6385\ (5)} = .63$ not .61

16. Water Calculation: $\frac{(.1330 \div .3540) + (-.0646)}{.0140\ (5)} = 4.44$ not 4.58

Therefore, TPM (Dry) = 22.1 - 4.44 - 1.21 = 16.5 not 16.3

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Appendix II

Federal Trade Commission

TPM (Dry), Nicotine and Carbon Monoxide Measurements

Data Dated March 1983

Posting Errors

Date	Cigarette No.	Run	Port	TPM (Dry) Posted As	TPM (Dry) Should Be	Nicotine Posted As	Nicotine Should Be	Carbon Monoxide Posted As	Carbon Monoxide Should Be
Posting Errors to Summary Sheets									
4/15/82	155	5	14					15.3	15.5
5/06/82	18M	4	8			.76	.70		
5/11/82	18M	2	2			.74	.84		
5/13/82	12	3	17	*	15.5	*	.98	*	14.4
6/09/82	18M	6	4					13.5	13.0
6/30/82	18M	6	9	13.4	13.2				
7/02/82	55	6	7	*	8.8	*	.75	*	9.6
7/12/82	175	1	10	*	13.5	*	.98	*	16.2
7/13/82	147	1	9	*	8.4	*	.65	*	9.7
7/13/82	104	4	6	*	17.3	*	1.44	*	16.2
7/16/82	85	1	1	16.1	13.3	1.24	1.14	16.1	13.4
7/16/82	139	4	8			.63	.69		
7/21/82	59	2	11	*	27.1	*	1.75	*	17.3

*Not posted to summary sheet.

Posting Errors from Computer Printout

4/28/82	107	1	10					4.8	4.2
5/03/82	94	2	17					14.8	14.5
6/01/82	18M	4	3					11.3	12.8
6/10/82	18M	6	3					13.3	13.1
6/22/82	22	1	19					5.8	5.3
7/02/82	165	3	18					13.8	13.3
7/14/82	56	2	1					8.1	8.7

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Appendix III

Federal Trade Commission

TPM (Dry), Nicotine and Carbon Monoxide Determinations

Data Dated March 1983

Impossible Errors

Date	Cigarette No.	Run	Port	Reason
3/31/82	#128	1	9	TPM (Wet) = -.2
3/31/82	# 28	1	14	TPM (Wet) = -.36 & TPM (Dry) = -.08
3/31/82	#128	4	10	TPM (Wet) = -.2
3/31/82	# 28	5	16	TPM (Wet) = -.2
4/02/82	# 20	2	8	TPM (Wet) = -.3 & TPM (Dry) = -.09
4/07/82	#128	4	13	TPM (Wet) = -.18
4/12/82	# 20	4	11	TPM (Wet) = -.4 & TPM (Dry) = -.1
4/13/82	#131	4	19	TPM (Wet) = -.18 & TPM (Dry) = -.1
4/13/82	# 28	5	13	TPM (Wet) = -.1 & TPM (Dry) = -.06
4/14/82	#131	3	7	TPM (Wet) = -.18
4/14/82	# 28	4	5	TPM (Wet) = -.18
4/14/82	# 20	5	4	TPM (Wet) = -.1
4/14/82	#128	5	11	TPM (Wet) = -.06
4/27/82	#131	6	11	TPM (Wet) = -.38 & TPM (Dry) = -.19
4/28/82	#128	1	7	TPM (Wet) = -.2 & TPM (Dry) = -.18
4/28/82	#131	4	2	TPM (Wet) = -.1
4/29/82	#128	2	8	TPM (Wet) = -.3 & TPM (Dry) = -.1
5/03/82	#128	2	19	TPM (Wet) = -.3 & TPM (Dry) = -.1
5/04/82	# 20	3	5	TPM (Wet) = -.36
5/05/82	#131	3	14	TPM (Wet) = -.2 & TPM (Dry) = -.03
5/07/82	#128	2	12	TPM (Wet) = -.28 & TPM (Dry) = -.06
5/07/82	#131	4	1	TPM (Wet) = -.18 & TPM (Dry) = -.25

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Appendix III (Con't)

Date	Cigarette No.	Run	Port	Reason
5/10/82	# 20	2	9	TPM (Wet) = -.5 & TPM (Dry) = -.35
5/10/82	# 28	2	11	TPM (Wet) = -.4 & TPM (Dry) = -.3
5/10/82	# 20	5	15	TPM (Wet) = -.4 & TPM (Dry) = -.2
5/11/82	#128	5	14	TPM (Wet) = -.2 & TPM (Dry) = -.1
5/11/82	#131	5	16	TPM (Wet) = -.1 & TPM (Dry) = -.06
5/11/82	#131	6	10	TPM (Wet) = -.18 & TPM (Dry) = -.07
5/11/82	# 28	6	15	TPM (Wet) = -.28 & TPM (Dry) = -.08
5/12/82	# 28	4	17	TPM (Wet) = -.3 & TPM (Dry) = -.18
5/13/82	# 20	5	12	TPM (Wet) = -.1
5/27/82	# 28	6	8	TPM (Wet) = -.28 & TPM (Dry) = -.35
5/28/82	#128	3	2	TPM (Wet) = -.28 & TPM (Dry) = -.16
5/28/82	# 20	3	3	TPM (Wet) = -.3 & TPM (Dry) = -.35
5/28/82	# 28	5	9	TPM (Wet) = -.26 & TPM (Dry) = -.38
5/28/82	# 30	6	9	TPM (Dry) = -1.17
6/01/82	#131	3	5	TPM (Wet) = -.62 & TPM (Dry) = -.59
6/02/82	# 30	1	2	TPM (Dry) = -.07
6/10/82	# 28	6	10	TPM (Wet) = -.38 & TPM (Dry) = -.2
6/10/82	#128	1	16	TPM (Wet) = -.1 & TPM (Dry) = -.07
6/14/82	#128	2	20	TPM (Wet) = -.3 & TPM (Dry) = -.2
6/14/82	#131	4	3	TPM (Wet) = -.36 & TPM (Dry) = -.3
6/16/82	#131	6	18	TPM (Wet) = -.3 & TPM (Dry) = -.47
6/17/82	#131	4	6	TPM (Wet) = -.36 & TPM (Dry) = -.45
6/18/82	#128	1	4	TPM (Wet) = -.1 & TPM (Dry) = -.1
6/21/82	# 20	4	20	TPM (Wet) = -.5 & TPM (Dry) = -.59
6/22/82	# 28	2	6	TPM (Wet) = -.02 & TPM (Dry) = -.02

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Appendix III (Con't)

Date	Cigarette No.	Run	Port	Reason
6/22/82	#131	2	13	TPM (Dry) = -.04
6/25/82	#128	2	1	TPM (Wet) = -.08
7/08/82	# 32	3	1	TPM (Dry) = -.01
7/09/82	#131	1	4	TPM (Wet) = -.26 & TPM (Dry) = -.2
7/12/82	#128	4	18	TPM (Wet) = -.3 & TPM (Dry) = -.4
7/13/82	# 20	5	17	TPM (Wet) = -.26 & TPM (Dry) = -.19
7/14/82	#131	4	15	TPM (Wet) = -.3 & TPM (Dry) = -.4
7/14/82	# 28	4	18	TPM (Wet) = -.36 & TPM (Dry) = -.45
7/16/82	# 20	2	13	TPM (Wet) = -.3 & TPM (Dry) = -.3
7/16/82	# 28	3	12	TPM (Wet) = -.3 & TPM (Dry) = -.36
7/16/82	#131	4	10	TPM (Wet) = -.2 & TPM (Dry) = -.4
7/16/82	#128	5	17	TPM (Wet) = -.2 & TPM (Dry) = -.4
7/19/82	# 28	1	2	TPM (Wet) = -.3 & TPM (Dry) = -.5
7/19/83	# 20	1	19	TPM (Wet) = -.3 & TPM (Dry) = -.68
7/19/82	# 20	2	6	TPM (Wet) = -.46 & TPM (Dry) = -.6
7/19/82	# 20	3	2	TPM (Wet) = -.3 & TPM (Dry) = -.56
7/19/82	# 20	3	7	TPM (Wet) = -.4 & TPM (Dry) = -.8
7/19/82	#131	3	12	TPM (Wet) = -.4 & TPM (Dry) = -.9
7/19/82	#131	4	20	TPM (Wet) = -.38 & TPM (Dry) = -.7
7/20/82	# 28	1	19	TPM (Wet) = -.3 & TPM (DryO) = -.6
7/20/82	#128	2	12	TPM (Wet) = -.36 & TPM (Dry) = -.6
7/20/82	#131	2	17	TPM (Wet) = -.3 & TPM (Dry) = -.5
7/21/82	# 28	1	12	TPM (Wet) = -.3 & TPM (Dry) = -.47
7/21/82	# 20	2	14	TPM (Wet) = -.3 & TPM (Dry) = -.4

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Negative Water

Date	Cigarette No.	Run	Port	Reason
3/30/82	# 31	1	8	Water = -.24
3/30/82	# 63	2	11	Water = -.20
3/30/82	# 2	2	14	Water = -.33
3/30/82	# 6	3	7	Water = -.08
3/30/82	# 9	3	12	Water = -.24
3/30/82	#204	3	18	Water = -.14
3/31/82	*#128	1	9	Water = -.40
3/31/82	*# 28	1	14	Water = -.23
3/31/82	# 26	1	15	Water = -.004
3/31/82	# 72	1	19	Water = -.07
3/31/82	# 5	2	1	Water = -.21
3/31/82	#107	2	9	Water = -.24
3/31/82	#183	2	10	Water = -.09
3/31/82	# 73	2	11	Water = -.40
3/31/82	#133	2	19	Water = -.38
3/31/82	#185	3	7	Water = -.06
3/31/82	# 4	3	15	Water = -.28
3/31/82	# 31	4	1	Water = -.38
3/31/82	# 32	4	7	Water = -.42
3/31/82	*#128	4	10	Water = -.31
3/31/82	# 66	4	15	Water = -.07
3/31/82	#167	5	9	Water = -.05
3/31/82	*# 28	5	16	Water = -.29
3/31/82	# 9	5	18	Water = -.22
3/31/82	#185	5	19	Water = -.06
4/01/82	#129	2	10	Water = -.30
4/01/82	# 36	2	12	Water = -.08
4/01/82	# 93	3	8	Water = -.09

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Date	Cigarette No.	Run	Port	Reason
4/01/82	# 29	3	14	Water = -.25
4/01/82	#181	3	17	Water = -.20
4/02/82	#107	1	8	Water = -.001
4/02/82	# 63	1	14	Water = -.05
4/02/82	# 2	1	15	Water = -.12
4/02/82	# 60	1	20	Water = -.05
4/02/82	# 73	2	1	Water = -.09
4/02/82	# 22	2	3	Water = -.06
4/02/82	*# 20	2	8	Water = -.23
4/02/82	#132	2	10	Water = -.09
4/02/82	#133	2	20	Water = -.19
4/06/82	#182	1	4	Water = -.03
4/06/82	# 3	1	16	Water = -.43
4/06/82	#108	3	6	Water = -.11
4/06/82	#192	3	10	Water = -.06
4/06/82	# 44	3	14	Water = -.02
4/06/82	#107	3	16	Water = -.03
4/06/82	# 60	4	10	Water = -.19
4/06/82	# 9	4	11	Water = -.26
4/06/82	# 73	4	12	Water = -.27
4/06/82	# 93	4	18	Water = -.15
4/06/82	# 22	5	2	Water = -.11
4/06/82	# 32	5	8	Water = -.28
4/06/82	#204	5	13	Water = -.09
4/07/82	# 3	1	6	Water = -.17
4/07/82	# 34	1	14	Water = -.04
4/07/82	# 30	1	15	Water = -.24
4/07/82	#130	2	8	Water = -.19

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Date	Cigarette No.	Run	Port	Reason
4/07/82	#177	2	12	Water = -.21
4/07/82	# 42	2	16	Water = -.003
4/07/82	#132	3	11	Water = -.10
4/07/82	# 5	3	19	Water = -.09
4/07/82	# 33	3	20	Water = -.03
4/07/82	#133	4	1	Water = -.13
4/07/82	# 78	4	7	Water = -.06
4/07/82	# 31	4	10	Water = -.21
4/07/82	*#128	4	13	Water = -.19
4/07/82	# 2	4	18	Water = -.12
4/07/82	# 66	4	20	Water = -.06
4/07/82	# 4	5	8	Water = -.27
4/07/82	#181	5	18	Water = -.18
4/09/82	#182	1	2	Water = -.01
4/09/82	#129	2	2	Water = -.21
4/09/82	#180	3	3	Water = -.05
4/09/82	# 63	3	20	Water = -.15
4/12/82	# 45	1	10	Water = -.10
4/12/82	# 93	1	12	Water = -.14
4/12/82	#164	1	20	Water = -.05
4/12/82	# 31	2	2	Water = -.26
4/12/82	#183	2	19	Water = -.02
4/12/82	*# 20	4	11	Water = -.31
4/12/82	#132	4	13	Water = -.09
4/12/82	# 44	5	5	Water = -.06
4/12/82	#182	5	10	Water = -.13
4/12/82	# 22	5	13	Water = -.14
4/12/82	# 63	5	15	Water = -.23

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Date	Cigarette No.	Run	Port	Reason
4/12/82	#108	5	18	Water = -.09
4/13/82	#133	2	8	Water = -.17
4/13/82	#190	3	2	Water = -.02
4/13/82	# 29	4	12	Water = -.18
4/13/82	#129	4	16	Water = -.15
4/13/82	*#131	4	19	Water = -.01
4/13/82	#177	5	6	Water = -.22
4/13/82	*# 28	5	13	Water = -.06
4/13/82	# 78	1	8	Water = -.09
4/14/82	# 30	1	6	Water = -.15
4/14/82	# 9	1	9	Water = -.43
4/14/82	# 6	1	11	Water = -.42
4/14/82	# 21	2	4	Water = -.16
4/14/82	# 32	2	6	Water = -.17
4/14/82	#181	2	8	Water = -.10
4/14/82	#204	2	19	Water = -.28
4/14/82	# 4	2	20	Water = -.18
4/14/82	*#131	3	7	Water = -.52
4/14/82	#129	3	11	Water = -.46
4/14/82	#132	3	12	Water = -.08
4/14/82	# 29	3	13	Water = -.45
4/14/82	# 41	3	17	Water = -.24
4/14/82	*# 28	4	5	Water = -.57
4/14/82	# 43	4	9	Water = -.002
4/14/82	*# 20	5	4	Water = -.19
4/14/82	*#128	5	11	Water = -.52
4/14/82	#108	5	20	Water = -.001
4/15/82	#177	1	14	Water = -.24

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Date	Cigarette No.	Run	Port	Reason
4/15/82	#164	2	8	Water = -.01
4/15/82	# 31	2	19	Water = -.16
4/15/82	# 5	3	5	Water = -.01
4/15/82	# 34	6	6	Water = -.10
4/15/82	#181	6	11	Water = -.15
4/15/82	# 78	6	20	Water = -.13
4/16/82	#133	1	9	Water = -.07
4/16/82	# 34	1	13	Water = -.04
4/16/82	#180	2	4	Water = -.06
4/16/82	# 21	2	6	Water = -.17
4/16/82	#130	2	20	Water = -.15
4/16/82	#181	3	5	Water = -.05
4/16/82	# 93	4	9	Water = -.05
4/16/82	# 60	4	12	Water = -.10
4/16/82	# 73	4	15	Water = -.16
4/16/82	# 2	5	6	Water = -.11
4/16/82	# 4	5	7	Water = -.16
4/16/82	# 32	5	10	Water = -.19
4/16/82	# 30	5	16	Water = -.21
4/19/82	#108	1	2	Water = -.03
4/19/82	# 22	1	4	Water = -.10
4/19/82	# 21	1	12	Water = -.21
4/19/82	# 4	1	14	Water = -.18
4/19/82	#133	1	18	Water = -.16
4/19/82	#181	2	9	Water = -.05
4/19/82	#132	2	16	Water = -.11
4/19/82	# 32	3	4	Water = -.24
4/20/82	#129	6	18	Water = -.26

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Date	Cigarette No.	Run	Port	Reason
4/20/82	# 30	1	20	Water = -.24
4/21/82	# 31	1	16	Water = -.28
4/27/82	# 4	5	12	Water = -.26
4/27/82	# 5	5	14	Water = -.12
4/27/82	# 21	5	19	Water = -.08
4/27/82	*#131	6	11	Water = -.13
4/27/82	#177	6	16	Water = -.26
4/28/82	*#128	1	7	Water = -.03
4/28/82	#180	2	10	Water = -.13
4/28/82	# 63	3	8	Water = -.11
4/28/82	#177	3	18	Water = -.20
4/28/82	*#131	4	2	Water = -.24
4/28/82	# 22	4	6	Water = -.05
4/28/82	# 73	6	3	Water = -.005
4/28/82	# 9	6	20	Water = -.16
4/29/82	#132	1	6	Water = -.18
4/29/82	*#128	2	8	Water = -.22
4/29/82	# 73	4	4	Water = -.16
4/29/82	# 93	4	6	Water = -.13
4/29/82	#177	4	11	Water = -.10
4/29/82	# 60	5	1	Water = -.001
4/29/82	# 29	5	2	Water = -.26
4/29/82	# 32	5	14	Water = -.26
4/29/82	#130	5	16	Water = -.25
4/29/82	# 5	5	17	Water = -.02
4/29/82	#130	6	10	Water = -.25
5/03/82	# 73	2	7	Water = -.09

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Date	Cigarette No.	Run	Port	Reason
5/03/82	# 4	2	9	Water = -.24
5/03/82	# 30	2	11	Water = -.21
5/03/82	# 29	2	16	Water = -.06
5/03/82	*#128	2	19	Water = -.21
5/03/82	# 9	5	17	Water = -.09
5/04/82	#129	2	7	Water = -.12
5/04/82	#133	2	11	Water = -.08
5/04/82	#130	3	3	Water = -.23
5/04/82	*# 20	3	5	Water = -.32
5/04/82	# 63	3	16	Water = -.05
5/04/82	# 3	5	5	Water = -.12
5/04/82	# 29	6	1	Water = -.07
5/04/82	# 21	6	3	Water = -.17
5/04/82	# 6	6	10	Water = -.005
5/05/82	#132	2	3	Water = -.13
5/05/82	#177	3	5	Water = -.12
5/05/82	*#131	3	14	Water = -.18
5/05/82	# 2	4	2	Water = -.01
5/05/82	# 31	4	6	Water = -.17
5/05/82	# 60	4	18	Water = -.01
5/05/82	# 33	5	4	Water = -.01
5/05/82	#132	5	15	Water = -.04
5/06/82	#130	1	1	Water = -.04
5/06/82	# 73	1	13	Water = -.13
5/06/82	# 30	3	12	Water = -.16
5/06/82	# 31	5	4	Water = -.21
5/06/82	# 4	5	13	Water = -.06

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Date	Cigarette No.	Run	Port	Reason
5/06/82	#181	5	14	Water = -.04
5/06/82	#177	5	17	Water = -.10
5/06/82	#130	5	19	Water = -.18
5/06/82	#180	6	9	Water = -.04
5/07/82	# 32	2	2	Water = -.05
5/07/82	*#128	2	12	Water = -.15
5/07/82	# 9	4	6	Water = -.02
5/07/82	# 29	5	20	Water = -.02
5/10/82	*# 20	2	9	Water = -.17
5/10/82	*# 28	2	11	Water = -.10
5/10/82	# 3	2	17	Water = -.12
5/10/82	# 31	3	3	Water = -.05
5/10/82	# 73	3	16	Water = -.05
5/10/82	#129	4	5	Water = -.13
5/10/82	# 93	4	14	Water = -.04
5/10/82	#130	4	15	Water = -.16
5/10/82	# 9	5	10	Water = -.10
5/10/82	*# 20	5	15	Water = -.22
5/10/82	# 45	5	20	Water = -.02
5/11/82	# 21	2	8	Water = -.05
5/11/82	# 4	3	10	Water = -.04
5/11/82	# 3	5	9	Water = -.06
5/11/82	*#128	5	14	Water = -.09
5/11/82	*#131	5	16	Water = -.06
5/11/82	*#131	6	10	Water = -.05
5/11/82	*# 28	6	15	Water = -.12
5/12/82	#132	1	14	Water = -.03

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Date	Cigarette No.	Run	Port	Reason
5/12/82	# 30	1	19	Water = -.03
5/12/82	# 63	3	12	Water = -.04
5/12/82	#177	3	15	Water = -.08
5/12/82	# 32	4	9	Water = -.03
5/12/82	*# 28	4	17	Water = -.13
5/12/82	# 29	6	8	Water = -.17
5/12/82	# 2	6	12	Water = -.24
5/12/82	#204	6	16	Water = -.03
5/13/82	#129	2	12	Water = -.01
5/13/82	# 60	3	4	Water = -.02
5/13/82	#177	3	13	Water = -.02
5/13/82	*# 20	5	12	Water = -.15
5/13/82	# 30	5	13	Water = -.03
5/28/82	*#128	3	2	Water = -.06
5/28/82	#177	3	8	Water = -.10
5/28/82	# 32	3	12	Water = -.01
5/28/82	#180	5	18	Water = -.003
6/01/82	*#131	3	5	Water = -.02
6/09/82	# 73	6	2	Water = -.01
6/09/82	# 2	1	16	Water = -.03
6/09/82	#177	2	3	Water = -.15
6/09/82	#130	2	7	Water = -.13
6/09/82	# 31	2	14	Water = -.10
6/10/82	# 4	5	6	Water = -.02
6/10/82	#177	6	2	Water = -.10
6/10/82	*# 28	6	10	Water = -.10
6/10/82	# 31	6	20	Water = -.06

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Date	Cigarette No.	Run	Port	Reason
6/10/82	*#128	1	16	Water = -.04
6/14/82	*#128	2	20	Water = -.07
6/16/82	# 3	1	4	Water = -.002
6/16/82	# 21	3	9	Water = -.04
6/17/82	#130	4	4	Water = -.01
6/17/82	# 32	5	16	Water = -.0007
6/17/82	# 73	6	18	Water = -.03
6/18/82	*#128	1	14	Water = -.007
6/18/82	# 30	1	5	Water = -.18
6/18/82	#177	3	20	Water = -.04
6/18/82	#129	4	1	Water = -.10
6/18/82	# 30	5	3	Water = -.16
6/24/82	# 29	6	7	Water = -.05
6/25/82	# 30	1	4	Water = -.54
6/25/82	#108	1	12	Water = -.47
6/25/82	*#128	2	1	Water = -.11
6/25/82	#176	2	8	Water = -.49
6/25/82	# 60	3	3	Water = -.15
6/25/82	# 73	3	19	Water = -.02
7/02/82	# 30	4	14	Water = -.02
7/02/82	#130	6	2	Water = -.01
7/09/82	*#131	1	4	Water = -.03
7/13/82	# 31	1	13	Water = -.0002
7/13/82	*# 20	5	17	Water = -.03
7/13/82	# 3	6	11	Water = -.11
7/16/82	*# 20	2	13	Water = -.002

*Determinations had negative TPM (Wet) and/or TPM (Dry) also.

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Appendix IV

Federal Trade Commission

Tar, Nicotine and Carbon Monoxide Determinations

Data Dated March 1983

Rounding Errors

Brands	Average TPM (Dry) FTC Report	Summary Sheet
Barclay f sp m 85mm	1.1	1.045
Barclay f sp 100mm	3.2	3.145
Kent 100's f sp 100mm	14.2	14.145
Kool f sp m 85mm	16.6	16.545
Marlboro 100's f sp 100mm	16.9	16.845
Old Gold Straight n f sp 85mm	25.9	25.845
Old Gold Lights f sp 85mm	9.6	9.545
True 100's f sp 100mm	7.3	7.245

Brands	Average Nicotine FTC Report	Summary Sheet
Carlton f hp 85mm	.1	.02
Multifilter f sp m 85mm	.78	.7745
Now f sp m 85mm	.11	.1045
Now f hp 80mm	.1	.02

Brands	Average Carbon Monoxide FTC Report	Summary Sheet
Barclay f sp m 100mm	2.8	2.745
Benson & Hedges Lights 100's f hp m 100mm	12.2	12.147
Decade 100's f sp 100mm	6.2	6.1476
DuMaurier f hp 85mm	17.7	17.6476
Kent 100's f sp 100mm	13.2	13.145
L & M Lights f sp 85mm	7.1	7.045
More Lights 100's f hp m 100mm	9.3	9.247
Now f sp 85mm	1.5	1.447
Parliament Lights 100's f sp 100mm	11.2	11.147
Cambridge f hp 85mm	1	.03

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001

Appendix V

Federal Trade Commission

TPM (Dry), Nicotine and Carbon Monoxide Determinations

Data Dated March 1983

Shifts Between Tests

Brand	TPM (Dry) FTC TESTS #25	#24	Difference (#25 - #24)
Eve Lights 100's f sp 100mm	12.6	14.9	-2.3
Eve Lights 100's f sp m 100mm	12.6	14.8	-2.2
Lark Lights f sp 85mm	13.7	7.2	+6.5
Lark Lights 100's f sp 100mm	14.7	7.0	+7.7
More 120's f sp m 120mm	15.7	18.4	-2.7
Vantage Ultra Lights f sp 85mm	4.2	6.3	-2.1

Brand	Nicotine FTC TESTS #25	#24	Difference (#25 - #24)
Eve Lights 100's f sp 100mm	.97	1.16	-.19
Eve Lights 100's f sp m 100mm	.97	1.17	-.20
Lark Lights f sp 85mm	1.01	.61	+.40
Lark Lights 100's f sp 100mm	1.12	.61	+.51
More 120's f sp 120mm	1.23	1.44	-.21
More 120's f sp m 120mm	1.23	1.52	-.29
Picayune r n f sp 70mm	1.15	1.38	-.23

Brand	Carbon Monoxide FTC TESTS #25	#24	Difference (#25 - #24)
Lark Lights f sp 85mm	13.0	7.4	+5.6
Lark Lights 100's f sp 100mm	14.2	7.1	+7.1
Vantage Ultra Lights f sp 85mm	4.9	9.0	-4.1
Vantage Ultra Lights 100's f sp 100mm	5.5	7.9	-2.4

Source: https://www.industrydocuments.ucsf.edu/docs/xhkk0001